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9. "Experimental Researches in Electricity.—Fifth Series." By Michael Faraday, Esq., D.C.L., F.R.S., Fullerian Professor of Chemistry in the Royal Institution of Great Britain.

The object of the author in this paper is to investigate the nature of electro-chemical decomposition. From the consideration of the circumstances of difference that mark the electricities obtained from the common electrical machine, and from the voltaic battery, and of which he had already established the theory in preceding papers, he was led to expect that the employment of the former in effecting chemical decomposition would exhibit some new conditions of that action, evolve new series of the internal arrangements and changes of the substance under decomposition, and perhaps give efficient powers over matter as yet undecomposed. For the purpose of greater distinctness, he divides the inquiry into three heads. In the first, he treats of some new conditions of electro-chemical decomposition, and shows that that effect does not depend upon the simultaneous action of two metallic plates, since a single pole might be used to effect decomposition; in which case one or other of the elements liberated passes to that pole, and the other element to the other extremity of the apparatus, the air itself acting as a pole. In the second, he considers the influence of water in electro-chemical decomposition; and he combats the opinion that the presence of that fluid is essential to the process is erroneous, and shows that water is merely one of a very numerous class of bodies, by means of which the electric influence is conducted and decomposition effected. In the third, he enters at large into the investigation of the theory of electro-chemical decomposition; and after discussing at some length the various theories of different writers on this curious subject, he is led to consider the effect in question as produced by an internal corpuscular action, exerted according to the direction of the electrical current, and as being the result of a force either superadded or giving direction to the ordinary chemical affinity of the bodies present; that is, modifying the affinities in the particles through which the current is passing, so that they act with greater force in one direction than in another, and consequently cause them to travel, by a series of successive decompositions and recompositions, in opposite directions, so as to be finally disengaged at the boundaries of the decomposing body. Various experiments are detailed in corroboration of these views, which appear to explain, in a satisfactory manner, all the prominent features of electro-chemical decomposition.

10. "The Anatomy and Physiology of the Liver." By Francis Kiernan, Esq., M.R.C.S. Communicated by J. H. Green, Esq., F.R.S.

After giving a short account of the descriptions of Malpighi and other writers respecting the minute structure of the liver, the author proceeds to state the results of his own investigations on this subject. The hepatic veins, together with the lobules which surround them, resemble in their arrangement the branches and leaves of a tree; the substance of the lobules being disposed around the minute branches of the veins like the parenchyma of a leaf around its fibres. The hepatic

veins may be divided into two classes ; namely, those contained in the lobules, and those contained in canals formed by the lobules. The first class is composed of interlobular branches, one of which occupies the centre of each lobule, and receives the blood from a plexus formed in the lobule by the portal vein ; and the second class of hepatic veins is composed of all those vessels contained in canals formed by the lobules, and including numerous small branches, as well as the large trunks terminating in the inferior cava. The external surface of every lobule is covered by an expansion of Glisson's capsule, by which it is connected to, as well as separated from, the contiguous lobules, and in which branches of the hepatic duct, portal veins and hepatic artery ramify. The ultimate branches of the hepatic artery terminate in the branches of the portal vein, where the blood they respectively contain is mixed together, and from which mixed blood the bile is secreted by the lobules, and conveyed away by the hepatic ducts which accompany the portal veins in their principal ramifications. The remaining blood is returned to the heart by the hepatic veins, the beginnings of which occupy the centre of each lobule, and when collected into trunks pour their contents into the inferior cava. Hence the blood which has circulated through the liver, and has thereby lost its arterial character, is, in common with that which is returning from the other abdominal viscera, poured into the vena portæ, and contributes its share in furnishing materials for the biliary secretion. The paper is accompanied by numerous drawings of preparations made by the author, of the minute structure of the liver, in which the different sets of vessels and ducts were injected in various ways.

The Society then adjourned over the Long Vacation to the 21st of November next.